

Gulf Cooperation Council

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GSO 1843 (2010) (English): Food Grade Salt



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هيئة التقييس لدول مجلس التعاون لدول الخليج العربية
GCC STANDARDIZATION ORGANIZATION (GSO)

Draft: Final

GSO 5/FDS/1843 :2010(E)

ملح الطعام
Food Grade Salt

Prepared by:
Gulf technical committee for the specifications of food & agricultural products
sector

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ICS: 67,220,20

Food Grade Salt

ملح الطعام

Date of approval:
Legal status:

تاريخ الاعتماد:
صفة الإصدار:

تقديم

هيئة التقييس لدول مجلس التعاون لدول الخليج العربية هيئة إقليمية تضم في عضويتها الأجهزة الوطنية للمواصفات والمقاييس في دول الخليج العربية ، ومن مهام الهيئة إعداد المواصفات القياسية الخليجية بواسطة لجان فنية متخصصة .

وقد قامت هيئة التقييس لدول مجلس التعاون لدول الخليج العربية ضمن برنامج عمل اللجنة الفنية رقم 5 " اللجنة الفنية الخليجية لقطاع مواصفات المنتجات الغذائية والزراعية " بتحديث المواصفة القياسية الخليجية رقم ٢٠٠٧ / ١٨٤٣ " ملح الطعام " . وقامت (مملكة البحرين) بإعداد مشروع هذه المواصفة .

وقد اعتمدت هذه المواصفة كمواصفة (قياسية / لائحة فنية) خليجية مع إدخال التعديلات التالية:
- إضافة المستويات الدنيا والقصى المستخدمة لإضافة اليود إلى ملح الطعام في دول مجلس التعاون ضمن البند ٤,١,٤,٢ وفقاً للتعديل الصادر من منظمة الصحة العالمية والوارد بالدليل الإرشادي للعام ٢٠٠٧ م (WHO/NUT/96.13) .

وذلك في اجتماع مجلس إدارة الهيئة رقم () ، الذي عقد بتاريخ / / هـ ، الموافق م. / /

Foreword

Standardization Organization for GCC (GSO) is a regional Organization which consists of the National Standards Bodies of GCC member States. One of GSO main functions is to issue Gulf Standards /Technical regulation through specialized technical committees (TCs).

GSO through the technical program of committee TC No.5: " *The Gulf technical committee for the specifications of food and agricultural products sector* " has updated the Gulf Standard No. : GSO 1843/2007 " Food Grade Salt ". The Draft Standard has been prepared by (Kingdom of Bahrain)

This standard has been approved as Gulf (Standard / Technical Regulation) with technical modifications as follows:

- Addition of minimum & maximum levels for Iodine in food grade salt in GCC in accordance to WHO/NUT/96.13 for the year 2007.

by GSO Board of Directors in its meeting No..../..... held on / / H , / / G

FOOD GRADE SALT

1. SCOPE

This standard applies to salt used as an ingredient of food, both for direct sale to the consumer and for food manufacture. It applies also to salt used as a carrier of food additives and/or nutrients. Subject to the provisions of this standard more specific requirements for special needs may be applied. It does not apply to salt from origins other than those mentioned in Section 2, notably the salt which is a by-product of chemical industries.

2. COMPLEMENTARY REFERENCES

2.1 ISO 2479-1972 "Determination of matter insoluble in water or in acid and preparation of principal solutions for other determinations".

2.2 ISO 2480-1972 "Determination of sulphate content - barium sulphate gravimetric method".

2.3 ISO 2481-1973 "Determination of halogens, expressed as chlorine - mercurimetric method" (for the recovery of mercury from the laboratory waste, see Annex of ECSS/SC 183-1979).

2.4 ISO 2482-1973 "Determination of calcium and magnesium contents - EDTA complexometric methods".

2.5 ECSS/SC 183-1979 "Determination of potassium content by sodium tetraphenylborate volumetric method" or alternatively according to ECSS/SC 184-1979 "by flame atomic absorption spectrophotometric method".

2.6 ISO 2483-1973 "Determination of the loss of mass at 110°C".

2.7 ECSS/SC 144-1977 "Determination of copper content - zinc dibenzylthiocarbamate photometric method".

2.8 method ECSS/SC 311-1982 "Determination of arsenic content - silver diethylthiocarbamate photometric method".

2.9 method ECSS/SC 312-1982 "Determination of total mercury content - cold vapour atomic absorption spectrometric method".

2.10 method ECSS/SC 313-1982 "Determination of total lead content - flame atomic absorption spectrometric method".

2.11 method ECSS/SC 314-1982 "Determination of total cadmium content - flame atomic absorption spectrometric method".

2.12 method ESPA/CN 109/84 "Determination of total iodine content - titrimetric method using sodium thiosulfate".

3. TERMS AND DEFINITIONS

3.1 Food grade salt:

is a crystalline product consisting predominantly of sodium chloride. It is obtained from the sea, from underground rock salt deposits or from natural brine.

4. REQUIREMENTS

4.1 ESSENTIAL COMPOSITION AND QUALITY FACTORS

4.1.1 MINIMUM NaCl CONTENT

The content of NaCl shall not be less than 97% on a dry matter basis, exclusive of additives.

4.1.2 NATURALLY PRESENT SECONDARY PRODUCTS AND CONTAMINANTS

The remainder comprises natural secondary products, which are present in varying amounts depending on the origin and the method of production of the salt, and which are composed

mainly of calcium, potassium, magnesium and sodium sulphates, carbonates, bromides, and of calcium, potassium, magnesium chlorides as well. Natural contaminants may also be present in amounts varying with the origin and the method of production of the salt.

4.1.3 USE AS A CARRIER

Food grade salt shall be used when salt is used as a carrier for food additives or nutrients for technological or public health reasons. Examples of such preparations are mixtures of salt with nitrate and/or nitrite (curing salt) and salt mixed with small amounts of fluoride, iodide or iodate, iron, vitamins, etc., and additives used to carry or stabilize such additions.

4.1.4 IODISATION OF FOOD GRADE SALT

In iodine-deficient areas, food grade salt shall be iodised to prevent iodine-deficiency disorders (IDD) for public health reasons.

4.1.4.1 Iodine compounds

For the fortification of food grade salt with iodine, use can be made of sodium and potassium iodides or iodates.

4.1.4.2 Maximum and minimum levels

The maximum and minimum levels used for the iodisation of food grade salt shall be 15 – 40 ppm (parts per million) expressed as iodine 1.

4.1.4.3 Quality assurance

The production of iodised food grade salt shall only be performed by reliable manufacturers having the knowledge and the equipment requisite for the adequate production of iodised food grade salt, and specifically, for the correct dosage and even intermixing.

5. FOOD ADDITIVES

5.1 All additives used shall be of food grade quality.

5.2 ANTICAKING AGENTS

Maximum level in finished product

341 (iii) Tricalcium orthophosphate	20 g/kg
170 (i) Calcium carbonate	}
504 (i) Magnesium carbonate	}
530 Magnesium oxide	}
551 Silicon dioxide, amorphous	}
552 Calcium silicate	}
553 (i) Magnesium silicate	} GMP
554 Sodium aluminosilicate	}
556 Calcium aluminium silicate	}
470 Salts of myristic, palmitic or stearic acids (calcium, potassium, sodium)	}
538 Calcium ferrocyanide	}
536 Potassium ferrocyanide ²	} 10 mg/kg, singly or in
535 Sodium ferrocyanide ¹	} combination, as Fe (CN) ₆

¹ As per WHO/NUT/96,13 for the year 2007.

² The maximum level for Sodium and Potassium ferrocyanides may be 20 mg /kg when used in the preparation of "dendritic" salt.

5.3 EMULSIFIERS

433 Polyxyethylene (20) sorbitan monooleate 10 mg/kg

5.4 PROCESSING AID

900a Polydimethylsiloxane³ 10 mg residue/kg

6. CONTAMINANTS

Food grade salt may not contain contaminants in amounts and in such form that may be harmful to the health of the consumer. In particular the following maximum limits shall not be exceeded:

6.1 ARSENIC

- not more than 0.5 mg/kg expressed as As.

6.2 COPPER

- not more than 2 mg/kg expressed as Cu.

6.3 LEAD

- not more than 2 mg/kg expressed as Pb.

6.4 CADMIUM

- not more than 0.5 mg/kg expressed as Cd.

6.5 MERCURY

- not more than 0.1 mg/kg expressed as Hg.

7. HYGIENE

In order to ensure that proper standards of food hygiene are maintained until the product reaches the consumer, the method of production, packaging, storage and transportation of food grade salt shall be such as to avoid any risk of contamination.

8. SAMPLING

According to Appendix A.

9. TEST METHODS

9.1 DETERMINATION OF SODIUM CHLORIDE CONTENT

This method allows the calculation of sodium chloride content, as provided for in Section 4.1.1, on the basis of the results of the determinations of sulphate (Method 9.4), halogens (Method 9.5), calcium and magnesium (Method 9.6), potassium (Method 9.7) and loss on drying (Method 9.8). Convert sulphate to CaSO₄ and unused calcium to CaCl₂, unless sulphate in sample exceeds the amount necessary to combine with calcium, in which case convert calcium to CaSO₄ and unused sulphate first to MgSO₄ and any remaining sulphate to Na₂SO₄. Convert unused magnesium to MgCl₂. Convert potassium to KCl. Convert unused halogens to NaCl. Report the NaCl content on a dry matter basis, multiplying the percentage NaCl by 100/100-P, where P is the percentage loss on drying.

9.2 DETERMINATION OF INSOLUBLE MATTER

According to clause 2.1.

³ Polydimethylsiloxane is listed as an antifoam agent, lubricant, release and anti-stick agent and moulding aid (as Dimethylpolysiloxane) in the Codex Inventory of Processing Aids. Polydimethylsiloxane is listed as an antifoaming agent, anticaking agent and emulsifier in the Codex International Numbering System for Food Additives.

9.3 DETERMINATION OF SULPHATE CONTENT

According to clause 2.2.

9.4 DETERMINATION OF HALOGENS ⁴

According to clause 2.3.

9.5 DETERMINATION OF CALCIUM AND MAGNESIUM CONTENTS

According to clause 2.4.

9.6 DETERMINATION OF POTASSIUM CONTENT

According to clause 2.5.

9.7 DETERMINATION OF THE LOSS ON DRYING (CONVENTIONAL MOISTURE)

According to clause 2.6.

9.8 DETERMINATION OF COPPER CONTENT

According to clause 2.7.

9.9 DETERMINATION OF ARSENIC CONTENT

According to clause 2.8.

9.10 DETERMINATION OF MERCURY CONTENT

According to clause 2.9.

9.11 DETERMINATION OF LEAD CONTENT

According to clause 2.10.

9.12 DETERMINATION OF CADMIUM CONTENT

According to clause 2.11.

9.13 DETERMINATION OF IODINE CONTENT

According to clause 2.12.

10 PACKAGING, TRANSPORTATION AND STORAGE

In any salt iodisation program, it is important to ensure that salt contains the recommended amount of iodine at the time of consumption. The retention of iodine in salt depends on the iodine compound used, the type of packaging, the exposure of the package to prevailing climatic conditions and the period of time between iodisation and consumption. To ensure that iodized salt ultimately reaches the consumer with the specified level of iodine, the following precautions may be taken into consideration by countries where climatic and storage conditions could result in a large amount of iodine loss:

10.1 If necessary in order to avoid the loss of iodine, iodised salt should be packed in air tight bags of either high density polyethylene (HDPE) or polypropylene (PP) (laminated or non-laminated) or LDPE-lined jute bags (Grade 1803 DW jute bags lined with 150 gauge polyethylene sheet). In many countries, this may require a major switch from conventional packaging materials made of straw or jute. The cost of adding extra iodine to compensate for its loss from cheaper packaging (i.e., straw or jute) must be weighed against the cost of switching to the above expensive packing material.

⁴ An alternative method for the determination of halogens by using silver nitrate is being studied.

10.2 Bulk packing units should not exceed 50 kg (in accordance with International Labour Organization (ILO) Conventions) to avoid the use of hooks for lifting the bags.

10.3 Bags that have already been used for packing other articles such as fertilizers, cement, chemicals, etc. Should not be reused for packing iodised salt.

10.4 The distribution network should be streamlined so as to reduce the interval between iodisation and consumption of salt.

10.5 Iodised salt should not be exposed to rain, excessive humidity or direct sunlight at any stage of storage, transportation or sale.

10.6 Bags of iodised salt shall be stored only in covered rooms or “godowns” that have adequate ventilation.

10.7 The consumer should be similarly advised to store iodised salt in such a manner as to protect it from direct exposure to moisture, heat and sunlight.

11. LABELLING

In addition to the requirements of the Codex General Standard for the Labelling of Prepackaged Foods (CODEX STAN 1-1985, Rev. 2-1999) the following specific provisions apply:

11.1 THE NAME OF THE PRODUCT

11.1.1 The name of the product, as declared on the label shall be "salt".

11.1.2 The name "salt" shall have in its close proximity a declaration of either "Food Grade" or "Cooking Salt" or "Table Salt".

11.1.3 Only when salt contains one or more ferrocyanide salts, added to the brine during the crystallization step, the term "dendritic" could be included accompanying the name.

11.1.4 Where salt is used as a carrier for one or more nutrients, and sold as such for public health reasons, the name of the product shall be declared properly on the label, for example "salt fluoridated", "salt iodated", "salt iodized", "salt fortified with iron", "salt fortified with vitamins" and so on, as appropriate.

11.1.5 An indication of either the origin, according to the description on Section 2, or the method of production may be declared on the label, provided such indication does not mislead or deceive the consumer.

11.2 LABELLING OF NON-RETAIL CONTAINERS

Information for non-retail containers shall either be given on the container or in accompanying documents, except that the name of the product, lot identification and name and address of the manufacturer or packer shall appear on the container. However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

APPENDIX A
METHOD FOR SAMPLING OF FOOD GRADE SALT FOR DETERMINATION OF
SODIUM CHLORIDE

A.1. SCOPE

This method specifies the sampling procedure to be applied when determining the main component in order to assess the food grade quality of sodium chloride (salt) as provided for in the Codex Standard for Food Grade Salt, Section 3: "Essential Composition and Quality Factors". The criterion to be used for acceptance or rejection of a lot or consignment on the basis of this sample is also provided.

A.2. FIELD OF APPLICATION

This method is applicable to the sampling of any type of salt intended for use as food, either prepacked or in bulk.

A.3. PRINCIPLE

This method represents a variables sampling procedure for mean quality: blended bulk sample analysis.

A blended bulk sample is produced in such a way that it is representative of the lot or consignment.

It is composed of a proportion of items drawn from the lot or consignment to be analyzed.

Acceptance criterion is on the basis that the mean value obtained from analyses of those blended bulk samples must comply with the provision in the Standard.

A.4. DEFINITIONS

The terms used in this sampling method refer to those in the "Instructions on Codex Sampling Procedures" (CX/MAS 1-1987).

A.5. EQUIPMENT

The sampling equipment used should be adapted to the nature of the tests to be carried out (for example: sampling by borer, sampling equipment made of chemically inert material, etc.). The containers used for collecting the samples should be made of a chemically inert material and should be air-tight.

A.6. PROCEDURE

A.6.1 PREPACKED SALT

Sampling may be carried out by "random sampling" or by "systematic sampling". The choice of the method to be used depends on the nature of the lot (for example: if the packages are marked with successive numbers, systematic sampling may be suitable).

A.6.1.1 Random sampling

Draw the n items from the lot in such a way that each item in the lot has the same chance of being selected.

A.6.1.2 Systematic sampling

If the N units in the lot have been classified and can be numbered from 1 to N , the 1-in- k systematic sampling of n items can be obtained as follows:

- a) Determine the k value as $k = N/n$. (If k is not an integer, then round to the nearest integer).
- b) From the first k items in the lot take one at random and then make every k th item thereafter.

A.6.2 SALT IN BULK

Here, the lot is fictitiously divided into items (strata); a lot with a total mass of m kg is considered to be composed of m/100 items. In this case, it is necessary to draw up a "stratified sampling" plan appropriate to the lot dimension. The samples are selected from all the strata in proportion to the stratum sizes.

*Note: **Stratified sampling** of a population which can be divided into different subpopulations (called strata) is carried out in such a way that specified proportions of the sample are drawn from the different strata.*

A.6.3 CONSTITUTION OF THE SAMPLE

A.6.3.1 The size and the number of the items forming the sample depend on the type of salt and the lot magnitude. The minimum size to be taken into account should be in accordance with one of the following specifications according to the circumstances:

- 250 g of salt in bulk or prepacked in more than 1 kg packages;
- one package for prepacked salt in 500 g or 1 kg packages.

Concerning the number of samples to be drawn from the lot, an example of minimum sample number that would be picked up, can be found in the document CX/MAS 1-1987, Appendix V, Table 3, taking into account the magnitude of the lot and appropriate inspection level, in this case generally level 4 (see paragraph 8.4 in the same document).

A.6.3.2 Combine and mix well the different items drawn from the lot. This blended bulk sample constitutes the laboratory sample. More than one laboratory sample may be composed in such a manner.

A.7. ACCEPTANCE CRITERION

A.7.1 Determine the NaCl content (%) of at least two test portions of the laboratory sample.

A.7.2 Calculate the average of the results obtained for the n test portions of the laboratory sample using:

$$\bar{x} = \sum n/x \quad (n \geq 2)$$

A.7.3 In accordance with the provision for the relevant NaCl content (%), a lot or a consignment shall be considered acceptable if the following condition is verified:

$$\bar{x} \geq \text{minimum level specified}$$

A.8. SAMPLING REPORT

The sampling report should contain the following information:

- a) type and origin of the salt;
- b) alterations of state of the salt (e.g. presence of foreign matter);
- c) date of sampling;
- d) lot or consignment number;
- e) method of packing;
- f) total mass of lot or consignment;
- g) number, unit mass of packages and whether the mass is given net or gross;
- h) number of items sampled;
- i) number, nature and initial position of sampled items;

- j)* number, composition and mass of the bulk sample(s) and the method used to obtain and conserve it (them);
k) names and signature of people who have carried out the sampling.

A.9. BASIC REFERENCE

Document CX/MAS 1-1987.

A.10. REMARK

"Laboratory sample" is the "blended bulk sample" described in CX/MAS 1-1987, Appendix IV, paragraph 4-B.

References:

- Codex Stan 150, 1985, Rev. 1: 1997, Amendments 3 :2006 (Standard for Food Grade Salt).
- WHO/NUT/96.13 for the year 2007.